



PATENT APPLICATION  
Docket No: 14321.56

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of )  
                        )

Tetsuro Inui et al. )  
                        )

Serial No.: 10/624,082 ) Art Unit  
                        )

Filing Date: July 21, 2003 )  
                        )

Confirmation No.: 5995 )  
                        )

For: DISPERSION MONITORING METHOD AND )  
      APPARATUS AND DISPERSION SLOPE )  
      TEMPERATURE DEPENDENCY COMPENSATION )  
      METHOD AND APPARATUS )

CERTIFICATE OF DEPOSIT UNDER 37 C.F.R. § 1.8

I hereby certify that the following documents are being deposited with the United States Postal Service as First Class Mail, postage prepaid, in an envelope addressed to: Commissioner for Patents, PO Box 1450, Arlington, Virginia 22313-1450, on the 5<sup>th</sup> day of October 2005.

- Transmittal for Second Supplemental Information Disclosure Statement (3 pages)
- Second Supplemental Information Disclosure Statement (4 pages)
- Form PTO-1449 listing 11 references (2 pages)
- A copy of the reference listed on the Form PTO-1449
- Postcard

Respectfully submitted,

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Tetsuro Inui et al.

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### TRANSMITTAL FOR SECOND SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Transmitted herewith for filing and pursuant to 37 C.F.R. § 1.97 is an Information Disclosure Statement, which includes the following statements, if any, required variously by 37 C.F.R. § 1.98:

- Statement of relevance of selected cited references not in the English language which are not translated.
- Statement that selected cited references are substantially cumulative of an enclosed or previously submitted reference.
- Statement that selected cited references were previously cited by or submitted to the United States Patent and Trademark Office in a prior application which is relied upon for an earlier filing date under 35 U.S.C. § 120.

A. Additional Materials Required Due to Content of Information Disclosure Statement

Transmitted are the following documents in addition to the Second Supplemental Information Disclosure Statement as required variously under 37 C.F.R. § 1.98:

- Form PTO-1449 listing 11 references submitted for consideration.
- A copy of each of the 11 references listed on the Form PTO-1449.
- English translations of \_\_\_\_ (\_\_\_\_) of the references listed on the Form PTO-1449 which are not in the English language.
- Copies of the following documents from the prosecution of a previous, related application:
  - Form PTO-1449 AND INFORMATION DISCLOSURE STATEMENT; and
  - Form PTO-892

B. Additional Materials Required Due to Timing of Filing of Information Disclosure Statement

The transmitted Information Disclosure Statement is being filed within one (1) of the following four (4) time periods:

- I.  Prior to the later of either three (3) months following the filing date or the mailing of a first Office Action. Accordingly, no materials other than those listed above are enclosed.
- II.  Following the latter of either three (3) months following the filing date or the mailing of a first Office Action, but before the mailing of a final Office Action or a Notice of Allowance. Accordingly, to secure consideration thereof, one (1) of the following is also enclosed:
  - Promptness Certification; or
  - Check No. \_\_\_\_\_ in the amount of \$\_\_\_\_ constituting the submission fee set forth in 37 C.F.R. § 1.17(p).
- III.  After the mailing of a Notice of Allowance, but before payment of the Issue Fee. Accordingly, in order to secure consideration thereof, each of the following are also enclosed:
  - Promptness Certificate;
  - Petition for Consideration; and

Check No. in the amount of \$ \_\_\_\_\_ constituting the petition fee set forth in 37 C.F.R. § 1.17(i)(1).

IV.  After payment of the Issue Fee. Accordingly, in order to secure consideration thereof, each of the following are also enclosed:

Petition to Withdraw from Issue; and

Check No. \_\_\_\_\_ in the amount of \$ \_\_\_\_\_ constituting the petition fee set forth in 37 C.F.R. § 1.17(i)(1).

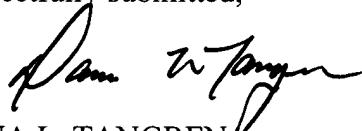
C. Fees

The Commissioner is hereby authorized to charge payment of or any deficiency in the following fees associated with this communication, or to credit any overpayment thereof, to Deposit Account No. 23-3178. A duplicate copy of this letter is enclosed.

- Any fee required in relation to filing of this letter or any documents transmitted therewith.
- The submission fee set forth in 37 C.F.R. § 1.17(p) in the event that 37 C.F.R. § 1.97(c) applies and the Examiner is not satisfied that any Promptness Certificate submitted meets the requirements of 37 C.F.R. § 1.97(e).
- The submission fee set forth in 37 C.F.R. § 1.17(p).
- The petition fee set forth in 37 C.F.R. § 1.17(i)(1).

Dated this 5<sup>th</sup> day of October 2005.

Respectfully submitted,



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Registration No. 37,246  
Customer No. 022913  
Telephone No. 801.533.9800



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APPARATUS AND DISPERSION SLOPE )  
TEMPERATURE DEPENDENCY COMPENSATION )  
METHOD AND APPARATUS )

SECOND SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT  
UNDER 37 C.F.R. § 1.97

Commissioner for Patents  
PO Box 1450  
Arlington, Virginia 22313-1450

Sir:

Please find, pursuant to 37 C.F.R. § 1.98(a)(1), the enclosed Form PTO-1449 which contains a list of all patents, publications, or other items that have come to the attention of one or more of the individuals designated in 37 C.F.R. § 1.56(c). While no representation is made that these references may be "prior art" within the meaning of that term under 35 U.S.C. §§ 102 or 103, the enclosed listed references are disclosed so as to fully comply with the duty of disclosure set forth in 37 C.F.R. § 1.56.

Moreover, while no representation is made that a specific search of office files or patent office records has been conducted or that no better art exists, the undersigned attorney of record believes that the enclosed art is the closest to the claimed invention (taken in its entirety) of which the undersigned is presently aware, and no art which is closer to the claimed invention (taken in its entirety) has been knowingly withheld.

In accordance with 37 CFR §§ 1.97 and 1.98, a copy of each of the listed references or relevant portion thereof is also enclosed.

Statement of Relevance of References Listed  
Unaccompanied by English Translation  
Under 37 CFR § 1.98(a)(3)

In accordance with 37 CFR § 1.98(a)(3), the following concise explanation of the relevance of each listed reference that is not in the English language and unaccompanied by a translation into English is provided.

Japanese Patent No. 10-319265: PROBLEM TO BE SOLVED: To compensate a dispersion slope in a wide range of wavelengths by using a 1st port of a specific optical circulator as an input and using a 4<sup>th</sup> port as an output. SOLUTION: A combination of a 1<sup>st</sup> chirped fiber grating 11 to which light is made incident from a long wavelength side and a 2<sup>nd</sup> chirped fiber grating 12 to which light is made incident from a short wavelength side is used. The 1<sup>st</sup> fiber grating 11 is made by a step chirp phase mask having a pattern of which I-th pitch is expressed by a formula I when observed from the short wavelength side divided into N. The 2<sup>nd</sup> fiber grating 11 is made by a step chirp phase mask having a pattern of which I-th pitch is expressed by a formula II when observed from the short wavelength side divided into N. In the formulae, it is assumed that I=1, 2,..., N,  $\Delta\Lambda = (\lambda_L - \lambda_S) / 2n$ , and  $\Lambda_o$  is a constant. However,  $\lambda_S$  is the shortest wavelength of the chirped fiber grating,  $\lambda_L$  is the longest wavelength, and n is an effective refractive index of the core.

Japanese Patent No. 2001-189696: PROBLEM TO BE SOLVED: To attain the waveform shaping of a WDM (wavelength Division Multiplexing) signal that is distorted by the dispersed slopes of fibers with a small constitution and to compensate the dispersion of various fiber transmission lines having different dispersion value or to compensate the dispersion fluctuation caused by the temperature change, etc., by means of a single element. SOLUTION: The WDM signal light that is distorted by the dispersion radiated from an input waveguide is separated into plural wavelength components by a wavelength separator and then transmitted through a lattice type optical element which can generate the dispersion compensation value corresponding to each wavelength component, a transversal optical element or a mixture element of the two optical elements. Each of transmitted signal light is multiplexed by a wavelength multiplexer and this multiplexed light is outputted from an output waveguide. The wavelength separator and the wavelength multiplexer can use an array waveguide lattice in addition to a multi-stage Mach-Zehnder interferometer, a bulk type optical filter or an optical filter containing the fiber type (or waveguide type) gratings connected together in a multi-stage form, etc., respectively.

Japanese Patent No. 2001-339345: PROBLEM TO BE SOLVED: To provide an optical reception station, an optical communication system and a spread control method that precisely control the wavelength spread of a transmission line for an optical signal adopting an optical duo binary modulation system. SOLUTION: The optical reception station 14 is provided with a spread compensation section 21 that receives an optical signal adopting the optical duo binary modulation system to revise the spread, an intensity detection section 22 that detects the intensity of a specific

frequency component in the optical signal, and a control section 23 that adjusts the spread of the spread compensation section 21 so that an output of the intensity detection means takes a prescribed extreme value.

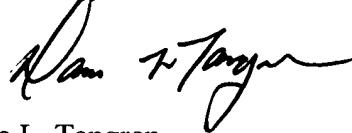
Japanese Patent No. 2002-057622: PROBLEM TO BE SOLVED: To provide a method and system by which such dispersion that is suitable for speed increase can be guaranteed to a WDM transmission system. SOLUTION: The method includes a step of generating WDM signal light by performing wavelength division multiplexing on a plurality of optical signals having different wavelengths, a step of transmitting the WDM signal light through an optical fiber transmission line, and a step of receiving the transmitted WDM signal light. The step of receiving the WDM signal light includes a step of detecting dispersion related to at least one of the optical signals and a step of offering a variable dispersion compensator which controls the amounts of dispersion and dispersion slope of the detected dispersion so that the dispersion may become smaller.

Japanese Patent No. 2002-064430: PROBLEM TO BE SOLVED: To an arbitrary group delay characteristic (chromatic dispersion characteristic) by a simple configuration and the simulative reproduction of the group delay characteristic (chromatic dispersion characteristic) of an actual optical-fiber transmission line. SOLUTION: By combining with each other via optical circulators two kinds of chirped fiber gratings whereon incident lights are projected respectively from the short-wavelength and long-wavelength sides of respective reflection wavelengths, a group delay dispersion emulator is so set that the synthesized group delay characteristic (chromatic dispersion characteristic) thereby simulates the group delay characteristic (chromatic dispersion characteristic) of an optical-fiber transmission line. When representing the length of each grating by L, the shortest- and longest-wavelengths of each reflection wavelength by  $\lambda_S$   $\lambda_L$  the difference between  $\lambda_L$  and  $\lambda_S$  by  $\Delta\lambda=\lambda_L-\lambda_S$ , and the coordinate of the longitudinal coordinate axis of each grating by z whose origin is set to the shortest-wavelength portion, distributions  $\lambda(z)$  of the longitudinal reflection wavelengths of the respective chirped fiber gratings are specified respectively by the equations of  $\lambda(z)=\lambda_S+\Delta\lambda(z/L)1/2$  and  $\lambda(z)=\lambda_S+\Delta\lambda\{1-(1-z/L)1/2\}$ .

Japanese Patent No. 2002-077053: PROBLEM TO BE SOLVED: To provide a wavelength dispersion compensation system that can accurately detect a zero value of remaining wavelength dispersion after wavelength dispersion compensation so as to compensate the wavelength dispersion with respect to the wavelength dispersion compensation system that improves deterioration in a transmission waveform due to the wavelength dispersion in an optical fiber transmission line. SOLUTION: The wavelength dispersion compensation system where the intensity of a specific frequency component of transmission data obtained by applying electric conversion to a received optical signal is monitored to control wavelength dispersion in a wavelength dispersion variable element thereby compensating the wavelength dispersion to which the received optical signal is subjected in the optical fiber transmission line. A wavelength dispersion attaching element having a wavelength dispersion that is equal to a difference between the wavelength dispersion at which the intensity of the specific frequency component of the transmission data is maximized, and the wavelength dispersion at which the waveform of the transmission data is optimum is inserted to a side monitoring the intensity of the specific frequency component of the transmission data or a side outputting the transmission data.

Dated this 5<sup>th</sup> day of October 2005.

Respectfully submitted,



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Applicant: Tetsuro Inui et al.  
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 TEMPERATURE DEPENDENCY COMPENSATION METHOD AND APPARATUS



Sheet 1 of 2  
 Confirmation No.: 5995  
 Atty Docket No.: 14321.56  
 Art Unit:

### SECOND SUPPLEMENTAL INFORMATION DISCLOSURE CITATIONS MADE BY APPLICANT

#### U.S. Patent Documents

Examiner Initial*	Document Number	Issue Date	Name
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#### Foreign Patent Documents

Examiner Initial*	Document Number	Publication Date	Country or Patent Office	Translation
1	10-319265	12/04/1998	Japan	No
2	2001-189696	07/10/2001	Japan	No
3	2001-339345	12/07/2001	Japan	No
4	2002-057622	02/22/2002	Japan	No
5	2002-064430	02/28/2002	Japan	No
6	2002-77053	03/15/2002	Japan	No

#### Other Documents

(including author, title, pertinent pages, etc.)

Examiner  
Initial\*

- \_\_\_\_ 7 T. Inui et al., *Adaptive Dispersion Slope Equalizer for Dispersion-shifted Fibers Using a Nonlinearly Chirped Fiber Bragg Grating Pair*, The 4<sup>th</sup> Pacific Rim Conference on Lasers and Electro-Optics, July 15, 2001, Volume Supplement 2001, pages 14-15 suppl.
- \_\_\_\_ 8 K. Kikuchi, *Highly Sensitive Interferometric Autocorrelator Using Si Avalanche Photodiode as Two-photon Absorber*, Electronics Letters, Vol. 34, No. 1, January 8, 1998, pp. 123-125.
- \_\_\_\_ 9 Kenji Taira et al., *Optical Sampling System at 1.55 μm for the Measurement of Pulse Waveform and Phase Employing Sonogram Characterization*, IEEE Photonics Technology Letters, Vol. 13, No. 5, May 2001, pp. 505-507.

Examiner: \_\_\_\_\_ Date Considered: \_\_\_\_\_

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609, draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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- \_\_\_\_ 10 B. J. Eggleton, *Integrated Tunable Fiber Grating for Dispersion Management in High-Bit Rate Systems*, Journal of Lightwave Technology, Vol. 18, No. 10, October 200, pp. 1418-1432.
- \_\_\_\_ 11 Correction to *Integrated Tunable Fiber Gratings for Dispersion Management in High-Bit Rate Systems*, Journal of Lightwave Technology, U.S., IEEE, Vol. 18. No. 11, November 2000, pp. 1591.

### References Cited by Applicants

While the filing of Information Disclosure Statements is voluntary, the procedure is governed by the guidelines of Section 609 of the Manual of Patent Examining Procedure and 37 C.F.R. §§ 1.97 and 1.98. To be considered a proper Information Disclosure Statement, Form PTO-1449 shall be accompanied by a copy of each listed patent or publication or other item of information and a translation of the pertinent portions of foreign documents (if an existing translation is readily available to the applicant), an explanation of relevance of each reference not in the English language, and should be submitted in a timely manner as set out in MPEP Sec. 609.

Examiners will consider all citations submitted in conformance with 37 C.F.R. § 1.98 and MPEP Sec. 609 and place their initials adjacent the citations in the spaces provided on this form. Examiners will also initial citations not in conformance with the guidelines which may have been considered. A reference may be considered by the Examiner for any reason whether or not the citation is in full conformance with the guidelines. A line will be drawn through a citation if it is not in conformance with the guidelines AND has not been considered. A copy of the submitted form, as reviewed by the Examiner, will be returned to the applicant with the next communication. The original of the form will be entered into the application file.

Each citation initialed by the Examiner will be printed on the issued patent in the same manner as references cited by the Examiner on Form PTO-892.

The reference designations "A1," "A2," etc. (referring to Applicant's reference 1, Applicant's reference 2, etc.) will be used by the Examiner in the same manner as Examiner's reference designations "A," "B," "C," etc. on Office Action Form PTO-1142.

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Examiner:

Date Considered:

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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609, draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.